REMARKS

The present invention is a method for constructing a reservoir model representative of an underground reservoir, including discretizing said reservoir by a set of grid cells, and associating with said reservoir model a permeability field constrained by a priori geologic data and production data or pressure data obtained from well tests collected in said reservoir. The method constructs an initial reservoir model including generating a permeability field in accordance with stochastic model coherent with the a priori geologic data; identifies zones inside said reservoir; calculates effective permeabilities of said zones and carries out, by means of a simulator, a simulation of fluid flows, to estimate corrections to be brought to said effective permeabilities to improve calibration relation to said production data or pressure data obtained from well tests; propagates said corrections to said set of grid cells to said reservoir model, by means of an iterative optimization process comprising minimizing a function which depends on said corrections, using a technique of gradual deformation of utilizations of said stochastic model; and using said reservoir model including said corrections propagated to said set of grid cells to develop said underground reservoir.

The method is disclosed as being useful for the development of reservoirs by constructing the reservoir model and using the model to develop the underground reservoir. See the original Abstract of the Disclosure which, in the last sentence, makes reference to "—Applications: notably oil reservoirs development for example". The specification has been amended at the end to recite "The invention has application notably in the development of oil reservoirs."

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With respect to the Examiner's Response to Arguments pertaining to the drawings, the Examiner is referred to the August 9, 2007 "Response to Notification of Non-Compliant Amendment".

Claims 27-42 stand rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter. Specifically, the Examiner reasons as follows.

> The claims are directed to an abstract idea and fail to set forth a practical application to produce a real world result. The final result of claim 27 is directed to propagating corrections to a set of grid cells of a reservoir model. However, the claim lacks a tangible result because no application is provided to the reservoir model in order to produce a real-world result. Therefore claim 27 fails to produce a useful, concrete, and tangible final result. Claims 28-42 depend from claim 27 and do not overcome the deficiencies of claim 27.

These grounds of rejection are traversed for the following reasons.

Claim 27 has been amended to recite "associating with said reservoir model a permeability field constructed by *a priori* geologic data and production data or pressure data obtained from well tests collected in said reservoir" and "using said reservoir model including said corrections propagated to said set of grid cells to develop said underground reservoir". Therefore, the rejection of claims 27-42 is submitted to be overcome in view of the recitation of "associating with said reservoir model...production data or pressure data obtained from well tests collected in said reservoir..." and "using the reservoir model to develop the underground reservoir" as disclosed in the original specification.

Claims 27-42 stand rejected under 35 U.S.C. §102 as being anticipated by U.S. Publication No. 2002/0013687 (Ortoleva). These grounds of rejection are traversed for the following reasons.

In the Advisory Action of August 23rd, the Examiner, in response to Applicants' statement that "paragraphs [0239] and [0240] do not disclose steps b-d

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of claim 27, which require manipulation of dynamic data pertaining to a permeability field" stated "attention is drawn to paragraphs [0122] and [0123]."

Claim 27 has been amended to replace the recitation "dynamic data" with "production data or pressure data obtained from well tests". This amendment is supported by the last sentence of paragraph [0001] of the Substitute Specification that "[t]hese data are, for example, production data or pressure data obtained from well tests."

For an anticipation rejection to be appropriate, it is necessary for the Examiner to demonstrate that each and every limitation of the claims which are alleged to be anticipated, are either explicitly present or inherently present in the reference. When this standard is applied, claims 27-42 are not anticipated or rendered obvious by Ortoleva.

The method for constructing a reservoir model representative of an underground zone in accordance with the invention involves associating with said reservoir model a permeability field constrained by *a priori* geological data and production data or pressure data obtained in said reservoir. Moreover, the method includes "constructing an initial reservoir model including generating a permeability field...; calculating effective permeabilities of said zones and carrying out, by means of a simulator, a simulation of fluid flows to estimate corrections to be brought to said effective permeabilities to improve calibration in relation to said production data or pressure data obtained from well tests; propagating said corrections to said set of grid cells of said reservoir model, by means of an iterative optimization process comprising minimizing a function which depends on said corrections, using a technique of gradual deformation of realizations of said stochastic model; and using

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said reservoir model including said corrections propagated to said set of grid cells to develop said underground reservoir."

It is noted that the Examiner in the Final Rejection referred to paragraph [0090] as representing identifying zones inside the reservoir and then further referred to calculating effective permeabilities of said zones being in paragraph [0097]. However, it should be noted that paragraphs [0090] – [0094] pertain to a Basin reaction, transport model called Basin RTM. See paragraph [0072]. Paragraph [0097] pertains to details of an Exemplary Embodiment. The zones which are described in paragraph [0097] do not pertain to paragraphs [0091]-[0094] or to production data or pressure data obtained from well tests as recited in the claims.

The Examiner's reliance on paragraphs [0097] and [0098] meeting "associating with said reservoir model a permeability field constrained by a priori geologic data and dynamic data (now recited as production data or pressure data obtained from well tests) collected in said reservoir..." is misplaced. Ortoleva pertains, in the cited portions, to a Basin RTM which does not describe the use of production data or pressure data obtained from well tests pertaining to a permeability field associated with a reservoir model. See paragraph [0071].

Dynamic data is only referred to beginning in paragraph [0212]. Paragraph [0239] describes a geostatistical method as being extensively used to construct the state of a reservoir which do involve "[t]wo significant methods have been developed to integrate the dynamic flow of information from production and monitoring wells and static data". Accordingly, insofar as the Examiner is relying upon the utilization of production data or pressure data obtained from well tests

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collected in said reservoir by measurements and observations, the production data or pressure data obtained from well tests collected in said reservoir would have to be described in paragraphs [0239] and [0240]. Paragraphs [0239] and [0240] do not disclose steps b-d of claim 27 which require manipulation of production data or pressure data obtained from well tests associated with a permeability field.

Claim 27 recites "propagating said corrections to said set of grid cells of said reservoir model, by means of an iterative optimization process comprising minimizing a function which depends on said corrections, using a technique of gradual deformation of realizations of said stochastic model". The estimated corrections are utilized which are produced by the calculation step "to improve calibration in relation to said production data or pressure data obtained from well tests data". The aforementioned identifying and calculation steps pass <u>the estimated corrections</u> to the propagating step thereby adjusting the effective permeabilities of the zones <u>without performing flow simulation at each iteration</u> for the propagating step.

This subject matter is not taught by Ortoleva as set forth in the steps of claim 27. Moreover, the Examiner has not demonstrated that there is an "identifying of zones inside said reservoir" which are associated with production data or pressure data obtained from well tests collected in the reservoir in combination with the calculating and propagating steps permitting adjustment of the effective permeabilities of the zones without performing the flow simulation at each iteration.

If the Examiner persists in the stated grounds of rejection, it is requested that he demonstrate more specifically in Ortoleva where the utilization of production data or pressure data obtained from well tests collected in the reservoir is associated with

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identifying zones inside said reservoir; calculating effective permeabilities of said zones in carrying out, by means of a simulator, a simulation of fluid flows to estimate corrections to be brought to said effective permeabilities to improve calibration in relation to said production or pressure data obtained from well tests; propagating said corrections to said set of grid cells of said reservoir by means of an iterative optimization process comprising minimizing a function which depends on said corrections, using a technique of gradual deformation of realizations of said stochastic model; and using said reservoir model including said corrections propagated to said set of grid cells to develop said underground reservoir.

In view of the foregoing amendments and remarks, it is submitted that each of the claims in the application is in condition for allowance. Accordingly, early allowance thereof is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 C.F.R. §1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (612.42904X00) and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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